EXHIBIT A

File No.: 16408-3US

Ottawa, Canada
December 14, 2004

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Andrew C. KARAPLIS**

For : USE OF PEX IN THE TREATMENT OF METABOLIC BONE DISEASES

Serial No. : 09/806,110

Filed : 08/31/2001

Examiner : Ram R. SHUKLA

Art Unit : 1632

DECLARATION Under 37 CFR 1.132

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
U. S. A.

Sir:

I, Arthur E. Broadus, M.D., Ph.D., am a citizen of the United States of America and hold a Doctor of Medicine degree and a Ph.D. in Physiology. I hold the position of Ensign Professor of Medicine and Section Chief, Endocrine Division, at the Yale University School of Medicine, New Haven, Connecticut, U.S.A.
I have more than 28 years experience in the field of medicine and, MAKE OATH AND SAY:

1. THAT, I have reviewed and understand the subject matter of the above-captioned U.S. application.

2. THAT the purpose of this Declaration is to convey my understanding and knowledge of the subject matter of the above-captioned U.S. Patent Application, and supporting evidence as herein provided as Exhibit B; and to provide my opinion thereof in relation to support for the claims of US Patent application S.N. 09/806,110 and in view of the teachings of Vickery in US Patent 6,583,114 and Chorev et al. in WO 96/19246, as currently cited by the Examiner against the subject matter of claims 7-10 of the present application.

3. THAT, in view of the rising incidence of bone diseases, such as osteoporosis, especially in the increasingly elderly population, there is a corresponding demand for effective methods of treating such metabolic bone diseases.

4. THAT it is known in the art that PTH and PTHrP are anabolic agents for bone and are the only two truly anabolic agents described to date; other agents in use may decrease bone loss and thereby have therapeutic potential, but only PTH and PTHrP cause an actual therapeutic increase in bone formation. This anabolic response is seen with intermittent PTH or PTHrP administration, as when they are administered daily.

5. THAT the above-captioned application (supplemented by Appendix B) shows that PEX (now "PHEX") is a type II integral membrane endopeptidase that is capable of cleaving PTH and PTHrP. This capacity to cleave PTH and PTHrP is unique to PEX and is not seen in other members (NEP or ECE) of the same endopeptidase family. PEX is highly expressed in bone and on osteoblastic bone cells.

6. THAT based on the findings of the above-captioned application, PTH and PTHrP are substrates of PEX. This point was established *in vitro* by using PEX-transfected cells that were capable of carrying out PTH cleavage and by using osteoblastic UMR cells to demonstrate cleavage of PTHrP, the latter experiment documenting that endogenous or native PTHrP is a PEX substrate.

7. THAT based on the findings of the above-captioned application, I would clearly understand that inhibition of PEX would be expected to result in 1) an increase in local endogenous PTHrP levels in or bound to osteoblasts and 2) would also be expected to prolong the "on time" of PTH bound to local osteoblastic PTH/PTHrP receptors and thereby potentiate PTH effects on these cells.

8. THAT I believe the above-noted application provides factual evidence and soundly predicts that PEX inhibitors, such as phosphoramidon, would result in an increase in PTH and/or PTHrP levels in the microenvironment of PTH/PTHrP receptors on osteoblasts, which would in turn lead to increase in bone formation. This approach represents a novel method of regulating bone formation that could form the basis of a novel therapy for osteopenic/osteoporotic states in humans. Indeed, this approach is sufficiently novel that a subsequent application from another party that described a compound that had such actions would be anticipated to form the basis of a successful use patent.

9. THAT the inventors completed an *in vitro* study using UMR-106 osteoblast cultured cells that were examined with respect to PTH/PTHrP mRNA levels (using RT-PCR) and PTH/PTHrP protein levels (using an immunoradiometic assay) in the presence of PBS/Pho or PBS (control); and wherein the finding of this study is summarized in Figure 1 of EXHIBIT B herein provided.

10. THAT the above *in vitro* study confirms that the Pho, an inhibitor or PEX, resulted in an increase in PTHrP protein levels in the osteoblast microenvironment. Based on what is known with respect to PTHrP and bone formation, an increase in PTHrP levels would be expected to increase bone formation.

11. THAT the above *in vitro* study supports the findings of the above-noted application, namely that PTH/PTHrP are substrates of PEX, and the inhibition of PEX activity results in an increase in osteoblast PTHrP levels.

12. THAT the above *in vitro* study supports that Pho inhibits PEX, where in the presence of Pho there is an increase in PTHrP levels, which further confirms that PTHrP is a substrate of PEX.

13. THAT the findings of the above *in vitro* study were further supported by an *in vivo* study to determine if the inhibition of PEX in fact results in an increase in bone formation, based on the maintenance of a serum bone marker indicative of bone formation.

14. THAT osteocalcin levels are known in the art to be directly proportional to bone formation levels; wherein an increase in osteocalcin level indicates an increase in bone formation.

15. THAT the inventors completed an *in vivo* study using eight C57BL/6 mice, where mice into 2 groups of 4: where (a) two mice injected daily for 14 days with PBS (control mice) and (b) two mice injected daily for 14 days with PBC/Pho; while (c) two mice injected daily for 36 days with PBS (control mice) and (d) two mice injected daily for 36 days with PBC/Pho; and the osteocalcin levels were measured at day 14 and day 36. The findings of this *in vivo* study are summarized in Figure 2 of EXHIBIT B herein provided.

16. THAT the above *in vivo* results show that osteocalcin levels were maintained in Pho-treated mice at day 36, whereas they were decreased in the PBS-treated control mice at day 36. The decrease in circulating osteocalcin in the control mice at day 36 is the expected result based on the progressive decrease in growth and bone formation in mice as they age, so that maintaining an elevated level of osteocalcin in the Pho-treated mice represents evidence that a high rate of bone formation continued in these mice.

17. THAT serum bone markers such as osteocalcin have been used in the clinical setting as predictors of a response to therapeutic treatment and have been used as surrogates for therapeutic responses before observed changes are or can be recorded by bone density measurements (or other techniques used to monitor bone mass).

18. THAT the *in vivo* results provide strong confirmatory evidence that inhibition of PEX may provide a novel method of treating osteopenic/osteoporotic bone disease.

19. THAT the results *in vitro* and *in vivo* combined suggest that activation of PEX would result in a decrease in local osteoblastic PTH/PTHrP levels, with a consequential decrease in bone formation. In this circumstance, osteocalcin levels would be expected to be decreased. This approach would represent a novel strategy for approaching osteosclerotic bone disorders in humans.

20. THAT PTH and PTHrP are powerful bone-forming agents and, as noted above, are the only two such bone anabolic agents known at present. Nevertheless, these two agents are biologically distinct. PTH is a systemic peptide hormone that acts on bone if and when its secretion is stimulated systemically by a reduction in the serum calcium concentration. In contract, PTHrP does not normally circulate but rather is an endogenous autocrine/paracrine product of osteoblasts resident in bone; germ-line haploinsufficientcy of PTHrP, as in the heterozygous PTHrP-null mouse (Amizuka N, et al., Dev. Biol., 1996, 175, 166-176), or conditional deletion of PTHrP in osteoblasts (Miao D, et al., J. Bone Min. Res., 2002, 17 (Suppl), S138), both result in quite striking osteopenia/osteoporosis, demonstrating that PTHrP is a locally-produced anabolic factor in bone.

Thus, local inhibition of PEX in osteoblasts would be expected to increase the effects of both circulating PTH and local PTHrP, and this mechanism is clearly unique to the novel approach described in the present application. The anabolic potential of this approach as it regards the anabolic effects of local PTHrP is abundantly clear from the heterozygous PTHrP-null mouse and the conditional knockout mouse findings noted above.

21. THAT based on my expertise in this area, the findings described in the above noted application and Appendix B indicate that the inhibition of PEX constitutes an entirely novel approach toward modulating the effects of systemic PTH and local osteoblastic PTHrP, which effects, singly or in combination, would be expected to be anabolic in bone.

22. THAT, I understand the teachings of Vickery et al to involve the systemic use of PTHrP analogs to enhance fracture healing in healing and/or non-healing fractures of long bones. In so far is my reading of the patent accurately describes its claims, these are limited to fracture healing and to systemic administration of PTHrP analogs. These claims do not include anabolic effects in bone per se nor do they involve a technique for modulating the effects of endogenous PTH or PTHrP in bone.

23. THAT I understand the teachings of Chorev et al to include the continuous low-dose administration of PTH, PTHrP or related compounds by systemic administration as a means of promoting bone formation. Key words here are "continuous" and "low-dose", for higher doses of continuously administered such peptides/analogs would be anticipated to result in catabolic rather than anabolic effects in bone. One can only presume that patents exist whereby PTH and related compounds are administered intermittently as anabolic agents and that these patents are the basis of the commercial anabolic PTH products presently marketed in the United States. One further assumes that patent of Chorev et al differs from such patents in the analogs claimed and/or in its use of continuous, low-dose products. In any event, the Chorev et al patent involves systemic administration of PTH/PTHrP and analogs and does target an anabolic effect in bone. However, here too, the approach differs entirely from the strategy involved in the above-captioned application, in that what Chorev et al teaches is neither targeted at PEX nor designed to modulate the effects of endogenous circulating PTH or local osteoblast-derived PTHrP. It merits emphasis here that

modulating PEX activity and therefore the presumed effects of circulating PTH and/or local osteoblastic PTHrP would, in essence, magnify the effects of endogenous agents that had been called into play by physiological stimuli either at the level of the parathyroids and/or at the level of the osteoblast. In either case, or both, magnifying such effects might be seen as physiologically based or, at least, more physiologically based than simply administering pharmacological products systemically.

24. THAT, I believe the findings of the above-noted application and the results as herein provided distinguish this application and its strategy very clearly from the teachings of either Vickery et al or Chorev et al. Specifically, and as noted in several preceding sections, the above-noted application has as its strategy the modulation of PEX activity, which would in turn magnify the effects of endogenous circulating PTH and/or the effects local osteoblast-derived PTHrP in bone. The entire strategy here differs from the simple systemic administration of PTH/PTHrP or any analog thereof and is therefore entirely novel.

25. THAT I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

FURTHER AFFIANT SAYETH NOT.

SIGNED AT New Haven, in the State of Connecticut, this 14th day of Dec. 2004.

SWORN before me at the City)
of New Haven, in the)
Province of Connecticut,)
this 14th day of Dec. 2004.)

Arthur E. Broadus

Barbara J. Wancook-Dillon 11/30/2005 exp.
Notary Public

CURRICULUM VITAE

Name: Arthur Eastwood Broadus

Born: March 28, 1941 -- Knoxville, Tennessee

Marital Status: Married (Carole Kepler Dickinson)

Children: Courtney Eastwood Broadus
Elizabeth Dickinson Broadus

Education:

1. The Lawrenceville School, Lawrenceville, NJ, 1956-60. Harvard Book Award.
2. B.A., Washington and Lee University, Lexington, VA, 1960-64. Gilliam Award.
3. M.D., Vanderbilt University School of Medicine, Nashville, TN, 1964-66 and 1969-71. Founder's Medal (first standing in class), Borden Award, Roche Award, Alpha Omega Alpha.
4. Ph.D., Vanderbilt University, Department of Physiology, 1966-69; thesis advisor, Earl W. Sutherland, Jr.

Positions Held:

1. Intern in Medicine, Massachusetts General Hospital, Boston, MA, 1971-72.
2. Assistant Resident in Medicine, Massachusetts General Hospital, Boston, MA, 1972-73.
3. Staff Associate, Endocrinology Branch, National Heart and Lung Institute and Endocrine Fellow, Combined Endocrine Training Program, National Institutes of Health, Bethesda, MD, 1973-76.
4. Assistant Professor of Internal Medicine, Yale University, New Haven, CT, 1976-80.
5. Associate Professor of Internal Medicine, term appointment, Yale University, New Haven, CT, 1980-84.
6. John Simon Guggenheim Fellow and Visiting Associate Professor of Medicine, Harvard Medical School, Boston, MA, 1982-83.
7. Associate Professor of Internal Medicine, without term, Yale University, New Haven, CT, 1984-87.
8. Section Chief, Division of Endocrinology and Metabolism, Yale University, 1986-present.
9. Professor of Internal Medicine, Yale University, New Haven, CT, 1987-present.
10. Professor of Cellular and Molecular Physiology, Yale University, New Haven, CT, 1990-present.
11. Ensign Professor of Internal Medicine, Yale University, New Haven, CT, 1994-present
12. Associate Chair for Research Programs, Department of Internal Medicine, Yale University, New Haven, CT, 1994-present

Society Membership and Honors:

Alpha Omega Alpha, American Federation of Clinical Research, Endocrine Society, American Society for Bone and Mineral Research, American Society for Clinical Investigation, John Simon Guggenheim Fellow (1982), Fellow of Davenport College, Yale University (1986-), Frederic C. Bartter Award of the American Society for Bone and Mineral Research (1989), American Association of Physicians (1990-), Council of the American Society for Bone and Mineral Research (1990-93), NIH Merit Award (1992-), Program Chair, Second combined meeting of the American Society for Bone and Mineral Research and the International Bone and Mineral Society (1998).

Military Service: United States Public Health Service, 1973-76.

Certification: American Board of Internal Medicine, 1974.

Study Sections:

1. Career Development Study Section, Veterans Administration, 1984-87.
2. Scientific Advisory Committee for Biochemistry and Endocrinology, American Cancer Society, 1990-94 (Chair 1993-94).
3. Howard Hughes Medical Institute Medical Student Fellowship Committee, 1992-94.
4. NIH General Medicine B Study Section, 2000-present.

Editorial Boards:

1. Journal of Clinical Endocrinology and Metabolism, 1982-87.
2. American Journal of Physiology, 1988-.
3. Journal of Clinical Investigation, 1989-94.
4. Bone, 1990-.
5. Bone and Mineral, 1991-.

Publications: Listing attached.

PUBLICATIONS

Peer-reviewed Articles

1. Johnson RA, JG Hardman, AE Broadus, EW Sutherland. Analysis of adenosine 3',5'-monophosphate with luciferase luminescence. Anal Biochem 35:91, 1970.

2. Broadus AE, NI Kaminsky, JG Hardman, EW Sutherland, GW Liddle. Kinetic parameters and renal clearances of plasma adenosine 3',5'-monophosphate and guanosine 3',5'-monophosphate in man. J Clin Invest 49:2222, 1970.

3. Broadus AE, NI Kaminsky, RC Northcutt, JG Hardman, EW Sutherland, GW Liddle. Effects of glucagon on adenosine 3',5'-monophosphate and guanosine 3',5'-monophosphate in human plasma and urine. J Clin Invest 49:2237, 1970.

4. Kaminsky NI, AE Broadus, JG Hardman, DJ Jones, JH Ball, EW Sutherland, GW Liddle. Effects of parathyroid hormone on plasma and urinary adenosine 3',5'-monophosphate in man. J Clin Invest 49:2387, 1970.

5. Morgan HE, DCN Earl, AE Broadus, EB Wolpert, KE Giger, LS Jefferson. Regulation of protein synthesis in heart muscle. Effect of amino acid levels on protein synthesis. J Biol Chem 246:2151, 1971.

6. Ball JH, NI Kaminsky, JG Hardman, AE Broadus, EW Sutherland, GW Liddle. Effects of catecholamines and adrenergic-blocking agents on plasma and urinary cyclic nucleotides in man. J Clin Invest 51:2124, 1972.

7. Broadus AE, TAS Hanson, FC Bartter, J Walton. Primary hyperparathyroidism presenting as anticonvulsant-induced osteomalacia. Am J Med 63:298, 1977.

8. Broadus AE, JE Mahaffey, FC Bartter, RM Neer. Nephrogenous cyclic AMP as a parathyroid function test. J Clin Invest 60:771, 1977.

9. Broadus AE, LJ Deftos, FC Bartter. Effects of the intravenous administration of calcium on nephrogenous cyclic AMP: evaluation as a parathyroid suppression test. J Clin Endocrinol Metab 46:477, 1978.

10. Brennan MF, EM Brown, SJ Marx, AM Spiegel, AE Broadus, JL Doppman, B Webber, GD Aurbach. Recurrent hyperparathyroidism from an autotransplanted parathyroid adenoma. N Engl J Med 299:1057, 1978.

11. Broadus AE, M Dominguez, FC Bartter. Pathophysiologic studies in idiopathic hypercalciuria. J Clin Endocrinol Metab 47:751, 1978.

12. Broadus AE. Nephrogenous cyclic AMP as a parathyroid function test. Nephron 23:137, 1979.

13. Broadus AE, SO Thier. Metabolic basis of renal stone disease. N Engl J Med 300:839, 1979.

14. Brown EM, AE Broadus, MF Brennan, GD Aurbach, SJ Marx, AM Spiegel, RW Downs, M Attie, GD Aurbach. Direct comparison *in vivo* and *in vitro* of suppressibility of parathyroid function by calcium in primary hyperparathyroidism. J Clin Endocrinol Metab 48:604, 1979.

15. Brown EM, MF Brennan, AE Broadus, SJ Marx, DG Gardner, AM Spiegel, RW Downs, M Attie, GD Aurbach. Human parathyroid autographs: comparison of function *in vivo* and *in vitro*. J Clin Endocrinol Metab 486:648, 1979.

16. Gertner JM, R Horst, AE Broadus, H Rasmussen, M Genel. The effects of human growth hormone replacement on parathyroid function and vitamin D metabolism. J Clin Endocrinol Metab 49:185, 1979.

17. Mahnensmith R, SO Thier, RC Cooke, A Broadus, RA DeFronzo. The effect of acute metabolic acidemia on renal electrolyte transport in man. Metabolism 28:831, 1979.

18. Broadus AE, RL Horst, R Lang, ET Littledike, H Rasmussen. The importance of circulating 1,25-dihydroxyvitamin D in the pathogenesis of hypercalciuria and renal stone formation in primary hyperparathyroidism. N Engl J Med 302:422, 1980.

19. Broadus AE, RL Horst, JE Mahaffey, H Rasmussen. Primary hyperparathyroidism with intermittent hypercalcemia. Clin Endocrinol 12:225, 1980.

20. Rasmussen H, R Baron, A Broadus, R DeFronzo, R Lang, R Horst. $1,25(OH)_2D_3$ is not the only D metabolite involved in the pathogenesis of osteomalacia. Am J Med 69:360, 1980.

21. Stewart AF, R Horst, LJ Deftos, EC Cadman, R Lang, AE Broadus. Biochemical evaluation of patients with malignancy-associated hypercalcemia: evidence for humoral and non-humoral groups. N Engl J Med 303:1377, 1980.

22. Goltzman D, AF Stewart, AE Broadus. Malignancy-associated hypercalcemia: evaluation with a cytochemical bioassay for parathyroid hormone. J Clin Endocrinol Metab 53:899, 1981.

23. Stewart AF, A Vignery, A Silvergate, ND Ravin, V LiVolsi, AE Broadus, R Baron. Quantitative bone histology in humoral hypercalcemia of malignancy: uncoupling of bone cell activity. J Clin Endocrinol Metab 55:219, 1981.

24. Stewart AF, M Adler, CM Byer, GV Segre, AE Broadus. Calcium homeostasis in immobilization: an example of resorptive hypercalciuria. N Engl J Med 306:1135, 1982.

25. Stewart AF, R Romero, PE Schwartz, EI Kohorn, AE Broadus. Hypercalcemia associated with gynecologic malignancies. Biochemical Characterization. Cancer 49:2389, 1982.

26. Insogna KL, AE Broadus, JM Gertner. Impaired phosphorus conservation and 1,25-dihydroxyvitamin D generation during phosphorous deprivation in familial hypophosphatemic rickets. J Clin Invest 71:1562, 1983.

27. Stewart AF, KL Insogna, D Goltzman, AE Broadus. Identification of adenylate cyclase-stimulating activity and cytochemical glucose-6-phosphate dehydrogenase-stimulating activity in extracts of tumors from patients with humoral hypercalcemia of malignancy. Proc Natl Acad Sci USA 80:1454, 1983.

28. Broadus AE, JS Magee, LE Mallette, RL Horst, R Lang, PS Jensen, JM Gertner, R Baron. A detailed evaluation of oral phosphorus therapy in selected patients with primary hyperparathyroidism. J Clin Endocrinol Metab 56:953, 1983.

29. Rodan SB, KL Insogna, AM Vignery, AF Stewart, AE Broadus, SM D'Souza, DR Bertolini, GR Mundy, GA Rodan. Factors associated with humoral hypercalcemia of malignancy stimulate adenylate cyclase in osteoblastic cells. J Clin Invest 72:1511, 1983.

30. Insogna KL, AF Stewart, PA Namnum, EC Weir, A Vignery, RE Baron, JM Kirkwood, LJ Deftos, AE Broadus. Biochemical and histomorphometric characterization of a rat model for humoral hypercalcemia of malignancy. Endocrinology 114:888, 1984.

31. Broadus AE, KL Insogna, R Lang, LE Mallette, DA Oren, AS Kliger, AF Ellison. A consideration of the humoral basis and phosphate-leak hypothesis of absorptive hypercalciuria. J Clin Endocrinol Metab 58:161, 1984.

32. Broadus AE, KL Insogna, R Lang, AE Ellison, BE Dreyer. Evidence for disordered control of 1,25-dihydroxyvitamin D production in absorptive hypercalciuria. N Engl J Med 311:73, 1984.

33. Erickson SB, K Cooper, AE Broadus, LH Smith, PG Werness, HJ Binder, JW Dobbins. Oxalate absorption and postprandial urine supersaturation in an experimental human model of absorptive hypercalciuria. Clin Sci 67:131, 1984.

34. Broadus AE, SB Erickson, JM Gertner, K Cooper, JW Dobbins. An experimental human model of 1,25-$(OH)_2D$-mediated hypercalciuria. J Clin Endocrinol Metab 59:202, 1984.

35. Insogna KL, AE Broadus, BE Dreyer, AF Ellison, JM Gertner. Elevated production rate for 1,25-dihydroxyvitamin D in patients with absorptive hypercalciuria. J Clin Endocrinol Metab 61:490, 1985.

36. Broadus AE, D Goltzman, AC Webb, HM Kronenberg. Messenger RNA from tumors associated with humoral hypercalcemia of malignancy directs the synthesis of a secretory PTH-like peptide. Endocrinology 117:1661, 1985.

37. Insogna KL, M Mitnick, AF Stewart, WJ Burtis, LE Mallette, AE Broadus. Sensitivity of the parathyroid hormone--1,25-dihydroxyvitamin D axis to variations in calcium intake in patients with primary hyperparathyroidism. N Engl J Med 313:1126, 1985.

38. Merendino JJ, KL Insogna, LM Milstone, AE Broadus, AF Stewart. Cultured human keratinocytes produce a parathyroid hormone-like protein. Science 231:388, 1986.

39. Burtis WJ, AE Broadus, KL Insogna, EC Weir, AF Stewart. Two species of adenylate cyclase-stimulating activity in a murine squamous carcinoma model of humoral hypercalcemia of malignancy. Endocrinology 118:1982, 1986.

40. Stewart AF, KL Insogna, WJ Burtis, A Aminiafshar, T Wu, AE Broadus. Prevalence and characterization of the adenylate cyclase-stimulating activity in tumors associated with humoral hypercalcemia of malignancy. J Bone Min Res 1:267, 1986.

41. Gertner JM, DR Coustan, AS Kliger, LE Mallette, N Ravin, AE Broadus. Pregnancy is a state of physiological absorptive hypercalciuria. Am J Med 81:451, 1986.

42. Stewart AF, T Wu, WJ Burtis, EC Weir, AE Broadus, KL Insogna: The relative potency of a human tumor-derived PTH-like adenylate cyclase-stimulating preparation in three bioassays. J Bone Min Res 2:37, 1987.

43. Burtis WJ, T Wu, C Bunch, JJ Wysolmerski, KL Insogna, AE Broadus, AF Stewart: Identification of a novel 17,000 dalton PTH-like adenylate cyclase-stimulating protein from a tumor associated with humoral hypercalcemia of malignancy. J Biol Chem 262:7151, 1987.

44. Insogna KL, EC Weir, TL Wu, AF Stewart, AE Broadus, WJ Burtis, M Centrella. Co-purification of transforming growth factor ß-like activity with PTH-like and bone-resorbing activities from a tumor associated with humoral hypercalcemia of malignancy. Endocrinology 120:2183, 1987.

45. Stewart AF, WJ Burtis, T Wu, D Goumas, AE Broadus. Two forms of parathyroid hormone-like adenylate cyclase-stimulating protein derived from tumors associated with humoral hypercalcemia of malignancy. J Bone Min Res 2:587, 1987.

46. Stewart AF, T Wu, D Goumas, WJ Burtis, AE Broadus. N-terminal amino acid sequence of two novel tumor-derived adenylate cyclase-stimulating proteins: identification of parathyroid hormone-like and parathyroid hormone-unlike domains. Biochem Biophys Res Commun 146:672, 1987.

47. Mangin M, AC Webb, BE Dreyer, JT Posillico, K Ikeda, EC Weir, AF Stewart, NH Bander, L Milstone, DE Barton, U Francke, AE Broadus. Identification of a cDNA encoding a parathyroid hormone-like peptide from a human tumor associated with humoral hypercalcemia of malignancy. Proc Natl Acad Sci USA 85:597, 1988.

48. Insogna KL, BE Dreyer, M Mitnick, AF Ellison, AE Broadus. Determination of the production rate for 1,25-dihydroxyvitamin D in patients with sarcoidosis. J Clin Endocrinol Metab 66:72, 1988.

49. Weir EC, KL Insogna, DG Brownstein, LJ Old, NH Bander, AE Broadus. In vitro adenylate cyclase-stimulating activity predicts the occurrence of humoral hypercalcemia of malignancy in nude mice. J Clin Invest 81:818, 1988.

50. Weir EC, RW Norrdin, RE Matus, M Brooks, AE Broadus, M Mitnick, SD Johnson, KL Insogna. Humoral hypercalcemia of malignancy in canine lymphosarcoma. Endocrinology 122:602, 1988.

51. Stewart AF, M Mangin, T Wu, D Goumas, KL Insogna, WS Burtis, AE Broadus. A synthetic parathyroid hormone-like protein stimulates bone resorption and causes hypercalcemia in rats. J Clin Invest 81:596, 1988.

52. Sartori L, EC Weir, AF Stewart, AE Broadus, M Mangin, PQ Barrett, KL Insogna. Synthetic and partially purified adenylate cyclase-stimulating proteins from tumors associated with humoral hypercalcemia of malignancy inhibit phosphate transport in a PTH-responsive renal cell line. J Clin Endocrinol Metab 66:459, 1988.

53. Ikeda K, M Mangin, BE Dreyer, AC Webb, JT Posillico, AF Stewart, NH Bander, EC Weir, KL Insogna, AE Broadus. Identification of transcripts encoding a parathyroid hormone-like peptide in messenger RNAs from a variety of human and animal tumors associated with humoral hypercalcemia of malignancy. J Clin Invest 81:2010, 1988.

54. Broadus AE, M Mangin, K Ikeda, KL Insogna, EC Weir, WJ Burtis, AF Stewart. Humoral hypercalcemia of cancer: identification of a novel parathyroid hormone-like peptide. N Engl J Med 319:556, 1988.

55. Ikeda K, EC Weir, M Mangin, B Kinder, EM Brown, AE Broadus. Expression of messenger RNAs encoding a parathyroid hormone-like peptide in normal human and animal tissues with abnormal expression in human parathyroid adenomas. Molec Endocrinol 2:1230, 1988.

56. Mangin M, K Ikeda, BE Dreyer, L Milstone AE Broadus. Two distinct tumor-derived parathyroid hormone-like peptides result from alternative RNA processing. Mole Endocrinol 2: 1049, 1988.

57. Mangin M, K Ikeda, BE Dreyer, AE Broadus. Isolation and characterization of the human parathyroid hormone-like gene. Proc Natl Acad Sci USA 86:2408, 1989.

58. Deftos LJ, AF Gazdar, K Ikeda, A Broadus. The parathyroid hormone-related protein associated with malignancy is secreted by neuroendocrine tumors. Molec Endocrinol 3:503, 1989.

59. Ikeda K, EC Weir, K Sakaguchi, WJ Burtis, M Zimering, M Mangin, BE Dreyer, ML Brandi, GD Aurbach, AE Broadus. Clonal rat parathyroid cell line expresses a parathyroid hormone-related peptide but not parathyroid hormone itself. Biochem Biophys Res Commun 162:108, 1989.

60. Ikeda K, JT Posillico, MB Boyle, AC Webb, EM Brown, AE Broadus. Microinjected Xenopus oocytes secrete mature, biologically active parathyroid hormone. Molec Endocrinol 3:1084, 1989.

61. Ikeda K, C Lu, Weir EC, Mangin M, Broadus AE. Transcriptional regulation of the parathyroid hormone-related peptide gene by glucocorticoids and vitamin D in a human C-cell line. J Biol Chem 264:15743, 1989.

62. Weir EC, ML Brines, K Ikeda, WJ Burtis, AE Broadus, RJ Robbins. Parathyroid hormone-related peptide gene is expressed in the mammalian central nervous system. Proc Natl Acad Sci USA 87:108, 1990.

63. Ikeda K, A Arnold, M Mangin, B Kinder, NA Vydelingum, MF Brennan, AE Broadus. Expression of transcripts encoding a parathyroid hormone-related peptide in abnormal human parathyroid tissues. J Clin Endocrinol Metab 69:1240, 1989.

64. Lu C, K Ikeda, LJ Deftos, AF Gazdar, M Mangin, AE Broadus. Glucocorticoid regulation of parathyroid hormone-related peptide gene transcription in a human neuroendocrine cell line. Molec Endocrinol 3:2034, 1989.

65. Ikeda K, C Lu, EC Weir, M Mangin, AE Broadus. Regulation of parathyroid hormone-related peptide gene expression by cycloheximide. J Biol Chem 265:5398, 1990.

66. Burtis WJ, TG Brady, JJ Orloff, JB Ersbak, RP Warrell, BR Olson, TL Wu, ME Mitnick, AE Broadus, AF Stewart. Immunochemical characterization of circulating parathyroid hormone-related protein in patients with humoral hypercalcemia of cancer. N Engl J Med 322:1106, 1990.

67. Mangin M, K Ikeda, BE Dreyer, AE Broadus. Identification of an upstream promoter of the human parathyroid hormone-related peptide gene. Molec Endocrinol 4:851, 1990.

68. Thiede MA, AG Daifotis, EC Weir, ML Brines, WJ Burtis, K Ikeda, BE Dreyer, RE Garfield, AE Broadus. Intrauterine occupancy controls expression of the parathyroid hormone-related peptide gene in pre-term rat myometrium. Proc Natl Acad Sci 87:6969, 1990.

69. Mangin M, K Ikeda, AE Broadus. Structure of the mouse gene encoding the parathyroid hormone-related peptide. Gene 95:195, 1990.

70. Soifer NE, KE Dee, KL Insogna, WJ Burtis, LM Matovcik, TL Wu, LM Milstone, AE Broadus, WM Philbrick, AF Stewart. Parathyroid hormone-related protein: evidence for secretion of a novel mid-region fragment by three different cell types. J Biol Chem 267:18236, 1992.

71. Daifotis AG, EC Weir, BE Dreyer, AE Broadus. Stretch-induced parathyroid hormone-related peptide gene expression in the rat uterus. J Biol Chem 267:23455, 1992.

72. Vasavada RC, JJ Wysolmerski, AE Broadus, WM Philbrick. Identification and characterization of a GC-rich promoter of the human parathyroid hormone-related peptide gene. Molec Endocrinol 7:273, 1993.

73. Holt EH, RC Vasavada, NH Bander, AE Broadus, WM Philbrick. Region-specific methylation of the PTH-related peptide gene determines its expression in human renal carcinoma cell lines. J Biol Chem 7:20639, 1993.

74. Holt EH, C Lu, BE Dreyer, PS Dannies, AE Broadus. Regulation of parathyroid hormone-related peptide gene expression by estrogen in GH_4C_1 rat pituitary cells has the pattern of a primary response gene. J Neurochem 62:1239, 1994.

75. Wysolmerski JJ, AE Broadus, J Zhou, E Fuchs, L Milstone, WM Philbrick. Overexpression of parathyroid hormone-related protein in the skin of transgenic mice interferes with hair follicle development. Proc Natl Acad Sci 91:1133, 1994.

76. Yang KH, AE dePapp, NE Soifer, BE Dreyer, TL Wu, SE Porter, M Bellantoni, WJ Burtis, KL Insogna, AE Broadus, WM Philbrick, AF Stewart. Parathyroid hormone-related protein: evidence for isoform- and tissue-specific posttranslational processing. Biochemistry 33:7460, 1994.

77. Plawner LL, WM Philbrick, WJ Burtis, AE Broadus, AF Stewart. Cell type-specific secretion of parathyroid hormone-related protein via the regulated versus the constitutive secretory pathway. J. Biol. Chem. 270: 14078, 1995.

78. Wysolmerski JJ, JF McCaughern-Carucci, AG Daifotis, AE Broadus, WM Philbrick. Overexpression of parathyroid hormone-related protein or parathyroid hormone in transgenic mice impairs branching morphogenesis during mammary gland development. Development, 121: 3539, 1995.

79. Wysolmerski JJ, RC Vasavada, J Foley, EC Weir, WJ Burtis, SC Kukreja, TA Guise, AE Broadus, WM Philbrick. Transactivation of the PTHrP gene in squamous carcinomas predicts the occurrence of hypercalcemia in athymic mice. Cancer Research, 56:1043, 1996.

80. Foley J, JJ Wysolmerski, AE Broadus, WM Philbrick. Parathyroid hormone-related peptide gene expression in human squamous carcinoma cells is repressed by certain mutant isoforms of p53. Cancer Research, 56:4056, 1996.

81. Weir EC, WM Philbrick, M Amling, LA Neff, R Baron, AE Broadus. Targeted overexpression of parathyroid hormone-related peptide in chondrocytes causes chondrodysplasia and delayed endochondral bone formation. Proc. Natl. Acad. Sci. USA, 93:10240, 1996.

82. Holt EH, AE Broadus, ML Brines. Parathyroid hormone-related peptide (PTHrP) is produced by cultured cerebellar granule cells in response to L-type voltage-sensitive Ca^{2+} channel flux via a Ca^{2+}/calmodulin-dependent kinase pathway. J. Biol. Chem., 271: 28105, 1996.

83. Amling M, L Neff, S Tanaka, D Inoue, K Kuida, E Weir, WM Philbrick, AE Broadus, R Baron. Bcl-2 lies downstream of PTHrP in a signaling pathway that regulates chondrocyte maturation during skeletal development. J Cell Biol., 136:205, 1997.

84. Wysolmerski JJ, WM Philbrick, ME Dunbar, B Lanske, H Kronenberg, A Karaplis, AE Broadus. Rescue of the parathyroid hormone-related protein knockout mouse demonstrates that parathyroid hormone-related protein is essential for mammary gland development. Development, 125:1285, 1998.

85. Foley J, BJ Longely, JJ Wysolmerski, BE Dreyer, AE Broadus, WM Philbrick. PTHrP regulates epidermal differentiation in adult mice. J Invest Derm, 111:1122, 1998.

86. Brines ML, AE Broadus. Parathyroid hormone-related protein markedly potentiates depolarization-induced catecholamine release in PC12 cells via L-type voltage sensitive Ca^{2+} channels. Endocrinol, 140:646, 1999.

87. Brines, ML, Z Ling, AE Broadus. Parathyroid Hormone-related Protein Protects Against Kainic Acid Excitotoxicity in Rat Cerebellar Granule Cells by Regulating L-type Channel Calcium Flux. Neurosci Lett, 274:13, 1999.

88. Nakchbandi I, EE Weir, KL Insogna, WM Philbrick, AE Broadus. Parathyroid Hormone-related Protein Induces Spontaneous Osteoclast Formation via a Paracrine Cascade. Proc. Natl. Acad. Sci. (USA) 97(31): 7296, 2000.

89. Chatterjee O, I Nakchbandi, WM Philbrick, BE Dreyer, J-P Zhang, LK Kaczmarek, ML Brines, AE Broadus. Endogenous Parathyroid Hormone-related Protein Functions as a Neuroprotective Agent. Brain Research, 930(1-2):58-66, 2002.

90. Macica CM, Broadus AE. PTHrP regulates cerebral blood flow and is neuroprotective. Am J Physiol: Integr Comp Physiol 284: R1019-R1020, 2003.

Reviews, Chapters, and Editorials

1. Sutherland EW, JG Hardman, RW Butcher, AE Broadus. The biological role of cyclic AMP. Progress in endocrinology. In: *Excerpta Medica Int Cong Series* No 184:26, 1969.

2. Kaminsky, NI, JH Ball, AE Broadus, JG Hardman, EW Sutherland, GW Liddle. Hormonal effects on extracellular cyclic nucleotides in man. In: *Trans Assoc Am Phys* 83:235, 1970.

3. Broadus AE, JG Hardman, NI Kaminsky, JH Ball, EW Sutherland, GW Liddle. Extracellular cyclic nucleotides. In: *Annals NY Acad Sci* 185:50, 1971.

4. Broadus AE. Clinical cyclic nucleotide research. In: *Advances in Cyclic Nucleotide Research,* Vol 8. Eds, P Greengard, GA Robison. Raven Press, New York, 1977, pp 509-548.

5. Broadus A, R Horst, R Lang, H Rasmussen. Distinct subgroups of patients with primary hyperparathyroidism: $1,25(OH)_2D_3$ levels and response to phosphorous therapy. In: *Vitamin D. Basic Research and Its Clinical Application..* Eds, AW Norman, K Schaever, DV Herrath, HG Grigoleit, JW Coburn, HF DeLuca, EB Mawer, T Suda. Walter de Gruyter, Berlin, 1979, pp 1037-1039. Fourth Workshop on Vitamin D, Berlin, 1979.

6. Broadus AE. Nephrolithiasis in primary hyperparathyroidism. In: *Nephrolithiasis (Contemporary Issues in Nephrology*: Vol 5). Eds, FL Coe, BM Brenner, JH Stein. New York, Churchill-Livingston, Inc, pp 59-85, 1980.

7. Broadus AE, SO Thier. Current approach to nephrolithiasis. In: *Progress in Clinical Kidney Disease and Hypertension.* Ed, FD McDonald. Thieme-Stratton, Inc, New York, 1980, pp 176-197.

8. Broadus AE. Measurement of cyclic nucleotides. In: *Advances in Cyclic Nucleotide Research*, Vol 12. Ed, P Greengard, GA Robison. Raven Press, New York, 1980, pp 407-409.

9. Broadus, AE. Nephrogenous cyclic AMP. In: *Rec Prog Horm Res* 37:667, 1981.

10. Broadus AE, RL Horst, R Lang, ET Littledike, H Rasmussen. The pathophysiological basis of hypercalciuria in primary hyperparathyroidism. In: *Urolithiasis, Clinical and Basic Research.* Eds, LH Smith, WG Robertson, B Finlayson. Plenum Press, New York, 1981, pp 813-824.

11. Kinder BK, AE Broadus, R Lang, H Rasmussen. Diagnostic and therapeutic approaches to primary hyperparathyroidism. In: *Surg Clinics N America* 60:1285, 1980.

12. Brickman AM, AF Ellison, AS Kliger, R Lang, AE Broadus. Low urine volume in stone formers. In: *Ann Int Med* 93:644, 1980.

13. Baron R, A Vignery, R Lang, V LiVolsi, A Broadus. Inversion lacunae and coupling of resorption and formation: comparison between osteopenia and hyperparathyroidism. In: *Osteoporosis*. Eds, H Rasmussen, J Eisinger, A Precht. Armour-Montagu, Paris, 1980, pp 141-149.

14. Stewart AF, R Horst, LJ Deftos, AE Broadus. Biochemical and clinical classification of patients with malignancy-associated hypercalcemia. In: *Hormonal Control of Calcium Metabolism*. Eds, DV Cohn, RV Talmage, JL Matthews. Excerpta Medica Int Congress Series 511, Amsterdam, 1981, pp 79-86.

15. Broadus AE. Mineral metabolism. In: *Endocrinology and Metabolism,* First edition. Eds, P Felig, J Baxter, AE Broadus, LA Frohman. McGraw-Hill Book Co, New York, 1981, pp 963-1079.

16. Broadus AE. Nephrolithiasis. In: *Endocrinology and Metabolism*, First edition. Eds, P Felig, J Baxter, AE Broadus, LA Frohman. McGraw-Hill Book Co, New York, 1981, pp 1119-1172.

17. Stewart AF, AE Broadus. The regulation of renal calcium excretion: an approach to hypercalciuria. In: *Ann Rev Med* 32:457, 1981.

18. Broadus AE, H Rasmussen. Clinical evaluation of parathyroid function. In: *Am J Med* 70:475, 1981.

19. Broadus AE. Nephrolithiasis in primary hyperparathyroidism. In: *Hosp Pract* 17:98, 1982.

20. Broadus AE. Primary hyperparathyroidism. In: *Advances in Nephrology,* Vol II. Eds, J Hamburger, J Crosnier. J-P Grunfeld, MH Maxwell. Year Book, Chicago, 1982, pp 205-222.

21. Stewart AF, AE Broadus. Clinical and biochemical differentiation of primary hyperparathyroidism from malignancy-associated hypercalcemia. In: *Clin Surg Inter*, Vol 6, Ed, EL Kaplan. Churchill-Livingston, London, 1983, pp 200-211.

22. Broadus AE. Primary hyperparathyroidism viewed as a bihormonal disease process. In: *Min Elect Metab* 8: 199, 1981.

23. Broadus AE, AF Stewart. Humoral hypercalcemia of malignancy. In: *Clinical Disorders of Bone and Mineral Metabolism*. Eds, B Frame, JT Potts Jr. Excerpta Medica, Amsterdam, 1983, pp 284-287.

24. Baron R, S Magee, A Silvergate, A Broadus, R Lang. Estimation of trabecular bone resorption by histomorphometry: evidence for a prolonged reversal phase with normal resorption in post-menopausal osteoporosis and coupled increased resorption in primary hyperparathyroidism. In: *Clinical Disorders of Bone and Mineral Metabolism*. Eds, B Frame, JT Potts. Excerpta Medica, Amsterdam, 1983, pp 191-195.

25. Insogna KL, AE Broadus. Hypercalciuria as a metabolic disease. In: *Seminars in Urology,* Vol 2:20, 1984.

26. Broadus AE, AF Stewart. Humoral mechanisms of hypercalcemia. In: *Annual Advances in Bone and Mineral Research*, Vol 2. Ed, WH Peck, Excerpta Medica, Amsterdam, 1984, pp 311-365.

27. Broadus AE, KL Insogna, EC Weir, AMC Vignery, WJ Burtis, JW Godsall, AF Stewart. Malignancy-associated hypercalcemia. In: *Endocrinology.* Eds, F Labrie, L Proulx. Excerpta Medica, Amsterdam, 1984, pp 591-594.

28. Insogna KL, AE Broadus. Nephrolithiasis. In: *Current Therapy in Endocrinology and Metabolism.* Eds, DT Krieger, CW Bardin. CV Mosby, St. Louis, 1985, pp 353-363.

29. Godsall JW, WJ Burtis, KL Insogna, AE Broadus, AF Stewart. Nephrogenous cyclic AMP, adenylate cyclase-stimulating activity, and the humoral hypercalcemia of malignancy. In: *Rec Prog Horm Res* 40:705, 1986.

30. Broadus AE, WJ Burtis, DA Oren, L Sartori, L Gay, AF Ellison, KL Insogna. Concerning the pathogenesis of idiopathic hypercalciuria. In: *Contrib Nephrol* 58:127, 1987.

31. Insogna KL, AE Broadus. Hypercalcemia of malignancy. In: *Ann Review Med* 38:241, 1987.

32. Broadus AE. Calcium metabolism and parathyroid hormone. In: *Encyclopedia of Science and Technology*, McGraw-Hill Book Co, New York, 1987, pp 135-136.

33. Stewart AF, AE Broadus. Mineral metabolism. In: *Endocrinology and Metabolism*, Second edition. Eds, P Felig, J Baxter, AE Broadus, LA Frohman. McGraw-Hill Book Co, New York, 1987, pp 1317-1453.

34. Insogna KL, AE Broadus. Nephrolithiasis. In: *Endocrinology and Metabolism*, Second edition. Eds, P Felig, J Baxter, AE Broadus, LA Frohman. McGraw-Hill Book Co, New York, 1987, pp 1500-1577.

35. Stewart AF, KL Insogna, AE Broadus. Malignancy-associated hypercalcemia. In: *Endocrinology.* Second edition. Ed, LJ DeGroot, New York, Grune and Stratton. 1988, Vol. 2:967-983.

36. Broadus AE, M Mangin, K Ikeda, KL Insogna, EC Weir, WJ Burtis, AF Stewart. Humoral hypercalcemia of malignancy: identification and cloning of a PTH-like peptide. In: *Progress in Endocrinology*, Vol. 2. Eds, H Imura, K Shizume, S Yoshida. Excerpta Medica, Amsterdam, 1988, pp 1357-1362.

37. Burtis WJ, AE Broadus. Hypercalcemia and hypocalcemia. In: *Textbook of Internal Medicine.* First edition. Ed, WN Kelley. JB Lippincott, Philadelphia, 1989, pp 2246-2252.

38. Broadus AE, WJ Burtis, K Ikeda, KL Insogna, C Lu, JJ Orloff, AF Stewart, R Vasavada, EC Weir, M Mangin. Parathyroid hormone-related peptide. In: *Calcium Regulation and Bone Metabolism.* Eds, DV Cohn, FH Glorieux, TJ Martin. Excerpta Medica, Amsterdam, 1990, pp 80-88.

39. Stewart AF, AE Broadus. Humoral hypercalcemia of malignancy. In: *Advances in Endocrinology and Metabolism*, Vol. 1. Eds, E Massaferri, RA Kreisberg, RS Bar. Year Book, Chicago, 1990, pp 1-21.

40. Broadus AE. Physiologic functions of calcium, magnesium, and phosphorus. In: *Am. Soc. Bone & Min. Res. Primer* 1990, pp 29-30.

41. Broadus AE. Parathyroid hormone-related peptide. In: *West J Med* 153:660, 1990.

42. Stewart AF, AE Broadus. Parathyroid hormone-related proteins: coming of age in the 1990s. In: *J Clin Endocrinol Metab* 71:1410, 1990.

43. Broadus AE. Identification of the parathyroid hormone-related peptide. In: *Parathyroid Hormone-related Protein: Normal Physiology and its Role in Cancer*. CRC Press, Boca Raton, 1992, pp 1-23.

44. Broadus AE. Physiologic functions of calcium, magnesium, and phosphorus and mineral ion balance. In: *Am. Soc. Bone & Min. Res Primer*, 1993, pp 41-46.

45. Broadus AE, AF Stewart. PTHrP: structure, processing, and physiological actions. In: *The Parathyroids*, JP Bilezikian, ed. Raven Press, New York, 1994, pp 259-294.

46. Wysolmerski JJ, AE Broadus. Hypercalcemia of malignancy: the central role of parathyroid hormone-related protein. In: *Ann Rev Med* 45:189, 1994.

47. Stewart AF, KL Insogna, AE Broadus. Malignancy-associated hypercalcemia. In: *Endocrinology,* 3rd ed. LJ DeGroot, ed. Grune and Stratton, New York, 1995, pp 1061-1074.

48. Stewart AF, AE Broadus. PTH-related protein and humoral hypercalcemia of malignancy. In: *Harrison's Principles of Internal Medicine*, supplement 10. K.J. Isselbacher et al, eds. McGraw Hill, New York, 1994, pp 3-8.

49. Wysolmerski JJ, AE Broadus. Humoral hypercalcemia. In: *Molecular Endocrinology of Cancer.* J. Waxman, Ed. Cambridge Univ. Press, Cambridge, 347-379, 1996.

50. Philbrick WM, JJ Wysolmerski, S Galbraith, JJ Orloff, KH Yang, RC Vasavada, EC Weir, AE Broadus, AF Stewart. Defining the roles of parathyroid hormone-related protein in normal physiology. In: *Physiol. Rev.* 76: 127, 1996.

51. AE Broadus, Philbrick WM. Evidence that parathyroid hormone-related protein is a developmental regulatory molecule that may control tooth eruption. In: *Biological Mechanisms of Tooth Eruption,* Z. Davidovitch, J. Mah, eds., Harvard Press, pp. 31-37, 1998.

52. AE Broadus. Mineral balance and homeostasis. In: *Am. Soc. Bone & Min. Res. Primer*, fourth ed., 1999, pp 74-79.

53. Stewart AF, AE Broadus. Malignancy-associated hypercalcemia. In: *Endocrinology,* 4th ed. LJ DeGroot & JL Jameson, eds. W.B. Saunders Co, Philadelphia, PA, 2001, pp 1093-1100.

54. Clemens TL, AE Broadus. Physiological Actions of PTH and PTHrP IV. In: *The Parathyroids,* 2nd ed. JP Bilezikian, ed. Academic Press, New York, 2001, pp. 261-274.

55. Clemens TL, AE Broadus. Vascular; Cardiovascular; and Neurological Actions of Parathyroid-Related Protein. In: *Principles of Bone Biology*, 2nd ed. JP Bilezikian, LG Raisz, GA Rodan, eds. Academic Press, New York, 2002, pp.531-543.

56. AE Broadus. Case Records of the Massachusetts General Hospital. A 47 Year Old Woman with Late Recurrent Hyperparathyroidism. NEJM, 346(9):694-700, 2002

57. AE Broadus. Mineral Balance and Homeostasis. In: *Am. Soc. Bone & Min. Res. Primer,* 5th edition, pp 105-110, 2003.

58. Broadus AE, LH Golden. Humoral Hypercalcemia of Malignancy. In: *Encyclopedia of Hormones*, HL Henry, AW Norman, eds. Academic Press, San Diego, CA, pp.278-282, 2003.

Books

1. Endocrinology and Metabolism. Eds, P Felig, J Baxter, AE Broadus, LA Frohman. McGraw-Hill Book Co, New York, 1987.